

Voyages to Mars 3

Robots

Matt Shindell:

Hello, and welcome back to Voyages Tomorrow's from the Smithsonian's National Air and Space Museum: our monthly literary mix tape where we explore classic sci-fi readings with original music from DJ Kid Koala. This special series is releasing monthly, as we follow NASA's Perseverance Rover on its journey to the red planet. I'm your host, Matt Shindell.

Tracks one and two of our mix tape got us off the earth and past the moon. Now that we're on our trajectory toward Mars, track three is attributed to the technology that has made the exploration of Mars possible: robotics. Up to now, humans have not been able to go to Mars themselves. We've relied on the help of rovers and landers to be our eyes and ears on the surface, our mechanical boots on the ground. But the idea of robots has a long history. You can find descriptions of mechanical servants and artificial people, as far back as Greek mythology. The word robot entered our vocabulary in the 20th century, thanks to a hip play by the Czech playwright Karel Capek. The play was called R.U.R, Rossum's Universal Robots, and it described artificial people who had been created to perform industrial labor without complaint. So his new word robot was drawn from an old Slavonic word that meant servitude or forced labor.

In this installment we'll be listening to passages from two stories about mechanical humans from before the adoption of the word robot. Edward Ellis is the steam man of the prairies and L. Frank Baum's Ozma of Oz. You probably already know the author L. Frank Baum as the creator of "The Wizard of Oz" and "The Land of Oz". You know, Dorothy, the tin man, the scarecrow and the cowardly lion. But Baum wrote 13 sequels to The Wizard of Oz and introduced countless new imaginative characters.

In the third book, Ozma of Oz, Dorothy and her chicken Belina are again swept away to the land of Oz, where they meet an entirely new set of characters, one of whom is a mechanical man named Tick-Tock, who was the product of human engineering, designed to take commands and obey orders. As Tick-Tock explains to his new friends, "I'm only a machine, but I can think and speak and act when I'm properly wound up." While he's fitted with a combination steel brain, he has no conscience and no emotions. And he only does what he's commanded to do. Describing the moment that Dorothy and Belina meet Tick-Tock is Rebecca Ljungren, an astronomy educator from the national air and space museum.

Rebecca Ljungren:

Ozma of Oz by L. Frank Baum. Selections from chapter four: Tick-Tock, the machine man

Standing within the narrow chamber of rock, was the form of a man. Or, at least, it seemed like a man in the dim light. He was only about as tall as Dorothy herself, and his body was round as a ball and made out of burnished copper. Also, his head and limbs were copper and these were jointed or hinged to his body in a peculiar way, with metal caps over the joints, like the armor worn by knights in days of old. He stood perfectly still and where the light struck upon his form, it glittered as if made of pure gold.

"Don't be frightened!" Called Belina from her perch. "It isn't alive." "I see it isn't," replied the girl, drawing a long breath. "It is only made out of copper, like the old cattle in the barnyard at home," continued the hen, turning her head first to one side and then to the other, so that both her little round eyes could examine the object. "I wonder what this copper man was made for, and why it was locked up in this queer place. That is a mystery," remarked the hen, twisting her head to arrange her wing feathers with her bill.

Dorothy stepped inside the little room to get a back view of the copper man, and in this way, discovered a printed card that hung between his shoulders, it being suspended for my small copper pig at the back of his neck. She unfastened this card and returned to the path where the light was better and sat herself down upon a slab of rock to read the printing. "What does it say?" asked the hen curiously. Dorothy, read the card aloud, spelling out the big words with some difficulty. And this is what she read:

"Smith and tinkers patent, double action, extra responsive, thought creating, perfect talking mechanical man. Fitted with our special clockwork attachment. Thinks, speaks, acts, and does everything but live. Manufactured only at our works in Evna, land of Ev. All infringements will be promptly prosecuted according to law." "How queer!" Said the yellow hen. "Do you think that is all true my dear?" "I don't know," answered Dorothy, who had more to read, "Listen to this Belina. Directions for using: for thinking, wind the clockwork man under his left arm marked number one. For speaking, wind the clockwork man under his right arm marked number two. For walking and action, wind clockwork in the middle of his back marked number three N.B. This mechanism is guaranteed to work perfectly for a thousand years." "Well, I declare!" gasped the yellow hen in amazement.

"If the copper man can do half these things, he is a very wonderful machine. But I suppose it is all humbug, like so many other patented articles." "We might wind him up" suggested Dorothy, "and see what he'll do." "Where's the key to the clockwork?" asked Belina "Hanging on the pig, where I found the card," "then," said the hen, "let us try him and find out if he will go, he is warranted for a thousand years it seems, but we do not know how long he has been standing inside this rock." Dorothy had already taken the clock key from the peg.

"Which shall I wind up first?" She asked, looking again at the directions on the card. "Number one, I should think" returned Belina. "That makes him think, doesn't it?" "Yes". Said Dorothy and wound up number one under the left arm, "He doesn't see many different" remarked the hen, critically. "Why? Of course not. He is only thinking now" said Dorothy, "I wonder what he is thinking about. I will wind up his talk and then perhaps he can tell us." Said the girl. So she wound up number two and immediately the clockwork man said without moving any part of his body except his lips. "Good morning, little girl. Good morning, Mrs. Hen." The words sounded a little hoarse and creaky and they were uttered all in the same tone without any change of expression, whatever, but both Dorothy and Belina understood them perfectly.

"Good morning, sir." They answered politely. "Thank you for rescuing me", continued the machine in the same monotonous tone, which seemed to be worked by a bellows inside of him. Like the little toy lambs and cats, the children squeeze so that they will make noise. "Don't mention it," answer Dorothy. And then being very curious, she asked, "how did you come to be locked up in this place?" "It is a long story." Replied the copper man, "But I will tell it to you briefly. I was purchased from Smith and tinker. My manufacturers by a cruel King of Ev named Evaldo, who used to beat all of his servants until they died. However, he was not able to kill me because I was not alive. And one must first live in order die so that all his beating did me no harm, and merely kept my copper body well-polished. He locked me up in this rock, threw the key in the ocean."

"How very dreadful!" Exclaimed Dorothy. "It is indeed" said the machine. "When I found myself in prison, I shouted for help and tell my voice ran down. And then I walked back and forth in this little room until my action ran down. And then I stood still and thought until my thoughts ran down. After that, I remember nothing until you wound me up again."

"I've never seen anything like you in Kansas" said Dorothy, "and now sir, if you don't mind, I'll wind up your action." "That will please me very much" said the machine. So she wound up number three. And at once the copper man in a somewhat stiff jerky fashion walked out of the rocky cavern,

took off his copper hat and bowed politely. And then kneeled before Dorothy said, "from this time forth, I am your obedient servant, whatever you command that I will do willingly. If you keep me wound up," "What is your name?" She asked "Tick-Tock." He replied, "My former master gave me that name because my clockwork always ticks when it is wound up. "I can hear it now" said the yellow hen. "So can I" said Dorothy.

Matt Shindell:

Edward Ellis Was writing frontier adventures in the midst of the industrial revolution, and he saw how steam locomotives were beginning to transform the landscape of the American West. He put his steam powered man on the Prairie and described him much like a locomotive; powerful, towering, 10 feet tall and covered in steam expelling valves. Nick Partridge, co-host of the AirSpace podcast brings us the story of how the steam man was made.

Nick Partridge:

The Steam Man of the Prairies, by Edward Ellis selections from chapter three, A Genius.

Johnny came home one day and lay down upon the site by his mother and gave a great sigh. "What's the matter?" She inquired. "I want to make something." "Why then don't you make it?" "Because I don't know what it shall be. I fixed up everything I can think of." "And you are like Alexander's sighing for there are no more worlds to conquer. Is that it?" "Not exactly for there is plenty for one to do. If only I could find out what it is. Have you ever made a balloon?" The boy laughed.

"You were asking For the cat the other day and wondering what had become of her. I didn't tell you that the last I saw of her was through the telescope. She being about two miles up in the clouds and going about 50 miles an hour." "I thought you looked as though you knew something about her," replied the mother, trying to speak approvingly yet smiling in spite of herself.

"Can't you tell me something to make?" The boy asked finally. "Yes, there is something I have often thought of and wonder why it was not made long ago...But, you Are not smart enough to do it, Johnny." "Maybe not, but tell me what it is." "It is a man that shall go by steam." The boy lay still several minutes without speaking a word and then sprang up "By George I'll do it." And he started out of the room and was not seen again until night. His mother felt no anxiety. She was pleased for when the boy was at work, he was happy and she knew that he had enough now to keep him engaged for months to come. So it proved. He spent several weeks in thought before he made the first effort toward constructing his greatest success of all. He then enlarged his workshop and so arranged it that it would not be in danger of being seen by any curious eyes. He wanted no disturbance while engaged upon this scheme.

From a neighboring foundry whose proprietor took a great interest in the boy, he secured all that he needed. He was allowed full liberty to make what castings he chose and to construct whatever he wished. And so he began his work. The great point was to obtain the peculiar motion of a man walking. This secured, the man himself could easily be made and dressed up in any style required. Finally, the boy believed he had hit upon the true scheme. So he applied harder than ever scarcely pausing to take his meals.

Finally, he got the machine together, fired it up and with feelings somewhat akin to those of sir Isaac Newton and demonstrating the truth or falsity of some of his greatest discoveries, he watched the results. Soon, the legs began to move up and down, but never a step did they advance. The power was there sufficient to run a sawmill. Everything seemed to work, but the thing wouldn't go. The boy was not ready to despair. He seated himself on the bench beside the machine and keeping up a moderate supply

of steam, throwing in bits of wood and letting in water and necessary. He carefully watched the movement for several hours.

Occasionally Johnny walked slowly back and forth with his eyes upon the steady stepping endeavor to discover the precise nature of that which was lacking in his machine. At great length that came to him, he saw from the first that it was not merely required, that the steam man lift his feet and put them down again. But there must be a powerful impulse forward at the same moment. This was the single remaining difficulty to be overcome. And it required two weeks before Johnny Brainard succeeded.

When the rough figure was fairly in working order, the inventor removed everything from around it so that it stood alone in the center of the shop. Then he carefully led on steam. Before he could shut it off the steam men walked cleanly through the side of his shop and fetched up against the corner of the house with a violence that shook it to its foundation. In considerable trepidation, the youngster dashed forward, shut off steam and turned it around.

As it was too cumbersome for him to manage in any other way he very cautiously led on steam again and persuaded it to walk back into the shop, passing through the very same orifice through which it had emerged and came very nice going out the opposite side again. The great thing was now accomplished and the boy devoted himself to bringing it as near perfection as possible. The principle thing to be feared was it's getting out of order since the slightest disarrangement would be sufficient to stop the progress of the man. Johnny therefore made it of gigantic size, the body and limbs being no more than shells used as a sort of screen to conceal the workings of the engine. This was carefully painted and the machinery was made as strong and durable as it was possible for it to be. It was so constructed as to withstand the severe jolting to which it would necessarily be subjected.

And finally was brought as nearly perfect as it was possible to bring a thing, not possessing human intelligence. By suspending the machine so that its feet were clear of the floor. Johnny Brainerd ascertained that under favorable circumstances, it could do very nearly 60 miles an hour. It could easily do that and draw a train car connected to it on the railroad. While on a common road, it could make 30 miles the highest rate at which he believed it was possible for a wagon to be drawn upon land with any degree of safety. It was the boy's intention to run at 20 miles an hour while where everything was safe, he would demonstrate the power of the invention by occasionally making nearly double that. As it was, he rightly calculated that when it came forth, it would make a great sensation throughout the entire United States.

Matt Shindell:

Voyages to Mars is presented by AirSpace from the Smithsonian's National Air and Space Museum. It is produced by Katie Moyer, Matt Shindell, Jennifer Weingart and Andrew Fletcher mixed by Tarek Fouda, music by DJ Kid Koala

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